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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371**

0445-0306P

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09 NEW 9643

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/JP00/03692

June 7, 2000

June 10, 1999

TITLE OF INVENTION

METHOD FOR INTERMITTENTLY FORMING LAID LAYERS

APPLICANT(S) FOR DO/EO/US

KOBAYASHI, Hideo; SAKAMOTO, Masaki; OKUMURA, Masahide and KAWAJIRI, Hironobu

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39 (1).
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau. WO 00/76850 A1
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☒ is transmitted herewith.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4)
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☒ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 20. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98-1449 and International Search Report (PCT/ISA/210) w/ 2 refs.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:  
PCT/IPEA/409  
PCT/RO/101  
Four (4) Sheets of Formal Drawings

U.S. APPLICATION NO. (if known, see 37 CFR 1.55) <div style="font-size: 24pt; font-weight: bold; margin-top: 5px;">09/869643</div>		INTERNATIONAL APPLICATION NO. PCT/JP00/03692		ATTORNEY'S DOCKET NUMBER 0445-0306P																	
21. <input checked="" type="checkbox"/> The following fees are submitted: <b>BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5):</b> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO. .... \$1,000.00  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... \$860.00  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$710.00  International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$690.00  International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00 <b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>				<b>CALCULATIONS      PTO USE ONLY</b>																	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$      860.00																	
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:20%;">CLAIMS</th> <th style="width:20%;">NUMBER FILED</th> <th style="width:20%;">NUMBER EXTRA</th> <th style="width:20%;">RATE</th> </tr> <tr> <td>Total Claims</td> <td>5 - 20 =</td> <td>0</td> <td>X \$18.00</td> </tr> <tr> <td>Independent Claims</td> <td>2 - 3 =</td> <td>0</td> <td>X \$80.00</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable)      None</td> <td>+ \$270.00</td> </tr> </table>				CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	Total Claims	5 - 20 =	0	X \$18.00	Independent Claims	2 - 3 =	0	X \$80.00	MULTIPLE DEPENDENT CLAIM(S) (if applicable)      None			+ \$270.00	\$      0	
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<b>TOTAL OF ABOVE CALCULATIONS =</b>				\$      860.00																	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$      0																	
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Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$      0																	
<b>TOTAL NATIONAL FEE =</b>				\$      860.00																	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$      40.00																	
<b>TOTAL FEES ENCLOSED =</b>				\$      900.00																	
Amount to be:				\$																	
refunded				\$																	
charged				\$																	
a. <input checked="" type="checkbox"/> A check in the amount of \$ <u>900.00</u> to cover the above fees is enclosed.  b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.  c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>02-2448</u> .  <b>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR          1.137(a) or (b)) must be filed and granted to restore the application to pending status.</b>  Send all correspondence to: Birch, Stewart, Kolasch & Birch, LLP or Customer No. 2292 P.O. Box 747 Falls Church, VA 22040-0747 (703)205-8000  Date: <u>July 2, 2001</u>																					
<div style="text-align: right;">           By _____          John W. Bailey, #32,881       </div>																					

/REM

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PATENT  
0445-0306P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: KOBAYASHI, Hideo et al. Conf.:  
Int'l. Appl. No.: PCT/JP00/03692  
Appl. No.: New Group:  
Filed: July 2, 2001 Examiner:  
For: METHOD FOR INTERMITTENTLY FORMING  
LAID LAYERS

PRELIMINARY AMENDMENT

**BOX PATENT APPLICATION**

Assistant Commissioner for Patents  
Washington, DC 20231

July 2, 2001

Sir:

The following Preliminary Amendments and Remarks are respectfully submitted in connection with the above-identified application.

AMENDMENTS

IN THE SPECIFICATION:

Please amend the specification as follows:

Before line 1, insert --This application is the national phase under 35 U.S.C. § 371 of PCT International Application No. PCT/JP00/03692 which has an International filing date of June 7, 2000, which designated the United States of America and was published in English.--

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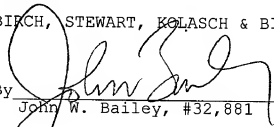
REMARKS

The specification has been amended to provide a cross-reference to the previously filed International Application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By   
John W. Bailey, #32,881

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JWB/rem  
0445-0306P

(Rev. 02/12/01)

09869643-02024

## DESCRIPTION

## METHOD FOR INTERMITTENTLY FORMING LAID LAYERS

## Technical Field

- 5 This invention relates to an intermittently laying method and an intermittently laying apparatus in which laid layers formed of a fluidized substance are intermittently formed on a surface of a sheet-like member (basefilm).

## Background Art

- 10 As a method for producing, on a mass production basis, products consisting of rectangular flat bags with fluidized substance contained therein, the bags being formed by sealing peripheral edge portions of a pair of top and back sheet-like members, there can be contemplated a method, as shown in Fig. 4, in which laid layers 43 formed of a fluidized substance are longitudinally and laterally arranged on an upper surface of a belt-like back surface sheet 42 which is moved in one direction by a conveyor 41, while interposing non-laid portions 44, a top sheet 45 is disposed in such a manner as to cover the laid layers 43, thereafter, the back and top sheets 42, 45 are sealed together at the non-laid portions 44 and then, the sealed portions are properly cut and divided.
- 15

- 20 As a method for disposing laid layers 43 formed of a fluidized substance on a band-like back surface sheet 42, which is flowingly moved in one direction, while interposing non-laid portions in the moving direction X, there can be contemplated, for example, a method for intermittently providing the non-laid portions 44 by repeating the supply and stop of the fluidized substance made by a coating head 46 at every predetermined time interval. However, this method has such inconveniences that controlling of the coating head 46 becomes complicated, the non-laid portion 44 is difficult to be interposed with high degree of precision in accordance with the moving speed of the back surface sheet 42, and production capability is not high.
- 25

It is an object of the present invention to provide an intermittently laying method and an intermittently laying apparatus in which laid layers formed of fluidized substance

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can easily be formed on a surface of a sheet-like member moving in one direction while intermittently interposing non-laid portions in the moving direction with high degree of accuracy and in which production capability can be enhanced.

### Disclosure of Invention

5 The present invention has achieved the above object by providing an intermittently laying method for intermittently forming laid layers comprising a fluidized substance laid thereon in the moving direction, on a surface of a sheet-like member moving in one direction, the method comprising steps of:

10 folding a part of the sheet-like member corresponding to a non-laid portion between adjacent laid portions inwardly towards a back surface side of the sheet-like member on an upstream side of laying means for laying the fluidized substance on the sheet-like member thereby forming a continuous surface-to-be-laid on a surface side;

continuously supplying the fluidized substance from the laying means to the surface-to-be-laid thereby forming the laid layer;

15 bringing back the inwardly folded non-laid portion of the sheet-like member so as to be flush with the surface-to-be-laid on a downstream side of the laying means; and

intermittently interposing the non-laid portion between continuously laid the adjacent laid layers formed of the fluidized substance.

20 Also, the present invention has achieved the above object by providing an intermittently laying apparatus for intermittently forming laid layers comprising a fluidized substance laid thereon on a surface of a sheet-like member moving in one direction, in the moving direction, the apparatus comprising:

25 laying means for laying the fluidized substance on the sheet-like member; folding means disposed on an upstream side of the laying means and adapted to fold a part of the sheet-like member corresponding to a non-laid portion between adjacent laid portions inwardly towards a back surface side of the sheet-like member thereby forming a continuous surface-to-be-laid on a surface side; and unfolding means disposed on a downstream side of the laying means and adapted to bring back the inwardly folded non-laid portion of the sheet-like member, so as to be flush with the surface-to-be-laid.

The above "sheet-like member (basefilm)" is a thin and flexible member which can

easily be bent, but which can be restored to its original state after the bending state is released, preferably with such features that no trace of bending remains. For example, film, paper, cloth, woven fabric, nonwoven fabric and the like can be used as the sheet-like member.

5 As means for moving the sheet-like member in one direction, there can be used a continuous transferring device such as, for example, a belt conveyor and a top plate chain of either the belt or block type which can continuously transfer the supplied items loaded thereon.

10 The above-mentioned term "fluidized substance" includes those having such fluidity as being able to be supplied to the surface of the sheet-like member and shape retainability capable of retaining its shape when laid in the form of layer. For example, it may include not only paste-like or half-fluidized substance having viscosity but also powder-like or particle-like substance.

15 The above-mentioned term "laying (including it's conjugation)" means that the fluidized substance is disposed on the surface of the sheet-like member in the form of layer by supplying the fluidized substance to the sheet-like member through laying means. It includes such concepts as to coat the fluidized substance onto the surface of the sheet-like member, to provide the fluidized substance, which has been formed by extrusion molding or roll molding, in such a manner as to cover the upper surface of the sheet-like member, to  
20 spray the fluidized substance onto the upper surface of the sheet-like member and so on.

#### Brief Description of the Drawings

Fig. 1 is a side view for explaining a construction of an intermittently laying apparatus according to one embodiment of the present invention;

25 Fig. 2(a), Fig. 2(b), Fig. 2(c), Fig. 2(d) and Fig. 2(e) are explanatory views showing several states in which a sheet-like member is folded inwardly towards a back surface side, Fig. 2(a) is an enlarged view of an A portion of Fig. 1, Fig. 2(b) is an enlarged view of a B portion of Fig. 1, Fig. 2(c) is an enlarged view of a C portion of Fig. 1, Fig. 2(d) is an enlarged view of a D portion of Fig. 1 and Fig. 2(e) is an enlarged view of an E

portion of Fig. 1;

Fig. 3 is an enlarged view of an F portion of Fig. 1 for explaining a state in which the sheet-like member is unfolded; and

Fig. 4 is an explanatory view for exemplifying a conventional method for manufacturing a product in which fluidized substances are received in a rectangular flat bag fabricated by sealing peripheral edge portions of a pair of sheet-like members.

### Best Mode for Carrying Out the Invention

One preferred embodiment of the present invention will be described. An intermittently laying method and an intermittently laying apparatus according to the present invention are employed at the time when a sheet-like detergent package obtained by receiving detergent in the form of a dough as a fluidized substance in a flat bag having a rectangular configuration in a plan view which flat bag is formed by sealing peripheral edge portions of a pair of top and back sheets is produced on a mass production basis. A coated layer (laid layer) 14 formed of dough-like detergent 13 is intermittently formed on a surface of a belt-like back surface sheet 12 which is continuously supplied in one direction and is moved, as if flowing, by a conveyor 11 in the moving direction X, while interposing non-coated portions (non-laid portions), using an intermittently laying apparatus of Fig. 1. The term "dough" herein used refers to a kneaded mixture obtained by mixing and kneading a powder composition with a substance having fluidity such as paste, gel or the like as disclosed in Japanese Patent Laid-Open Publication No. Hei 10-204499. The substance having fluidity includes those which are fluidized by heating or being stressed.

After a top sheet is disposed on a surface of each coated layer 14 while interposing the non-laid portions 15, in the same manner as shown in Fig. 4 in the next process, the top and back sheets are sealed at the non-coated portions 15 and then, the sealed portion is properly cut and divided to thereby obtain a sheet-like detergent package which is a rectangular flat bag consisting of a pair of top and back sheets and containing dough-like detergent therein.

The dough-like detergent 13 of this embodiment is a paste-like detergent having fluidity and plasticity which can be coated onto the surface of the back surface sheet 12 through the coating head 16 serving as laying means. The dough-like detergent 13 has



viscosity and such shape-retainability that it is not collapsed nor flowed out and it can be held in the coated state which is in the form of a layer. The back surface sheet 12 and the top surface sheet are fabricated of a fiber sheet composed of, for example, polyvinyl alcohol fiber or various kinds of water soluble films. Accordingly, when a predetermined number of the sheet-like detergent packages obtained by cutting and individually dividing the sealed portions are put into a washing machine at a time of washing with the use of a washing machine, the top and back sheets covering the dough-like detergent 13 are dissolved rapidly to facilitate easy dissolving of the packaged dough-like detergent in the washing water.

The intermittently laying apparatus 10 of this embodiment includes the coating head 16 for coating the dough-like detergent 13 onto the back surface sheet 12, folding means 17 disposed on an upstream side of the coating head 16 and adapted to fold the back surface sheet 12 inwardly and unfolding means 18 disposed on a downstream side of the coating head 16.

The folding means 17 includes a plurality of pin insert grooves 19 each serving as a push-in groove formed in the surface of the conveyor 11 at a predetermined interval (for example, 70 mm) in a moving direction X of the back surface sheet 12 which is moved by the conveyor 11 and extending in a direction perpendicular to the moving direction X, a plurality of pin members 20 capable of movement at the same speed as the pin insert groove 19 in the moving direction X and disposed such that the height of the center axis is brought to be generally equal to the center height of the pin insert groove 19 when it moves in the moving direction X and each serving as an insert member inserted along the pin insert groove 19, and an upstream side roll member 21 for making a change of direction of the conveyor 11 and guides it in the moving direction X. The function of the push-in grooves can be constituted by, for example, arranging two narrow rods side by side, as far as there are two spaced edge portions for forming the push-in grooves for supporting the sheets and a space defined between the two edge portions of the push-in grooves. The edge portions of the push-in grooves are approached to each other to make the surfaces of the sheets substantially continuous when the fluidized substance is laid as later described. The insert members serve to push a part of the sheet into between two spaced apart edge portions.

The pin insert groove 19 is, as shown in Fig. 2(a), formed in a surface of a belt body 22 of the conveyor 11 by arranging sponge plates 23 made of urethane having a thickness of 5 mm, for example, in a closely contacted relation with a gap of about 5 mm, for example, formed between the adjacent sponge plates 23 in such a manner as to have a width of 5mm and a depth of 5mm, for example, depending on the size dimension of the gap. The surface of each sponge plate 23 is covered with a protective film plate 24 composed of polyethylene terephthalate (PET) film having a thickness of 0.2 mm, for example, such that one end portion of the protective film plate 24 is expanded, as an edge portion, into a surface opening portion of the pin insert groove 19, thereby providing an opening width k of about 0.2 mm of the pin insert groove 19.

The sponge plate 23 has a soft material quality good enough to restrain its peel-off from the belt body 22 at the time of making a change of direction on the upstream side roll member 21. The protective film plate 24 has such resiliency that it can be deformed to the extent able to be inserted in the pin member 20 of the pin insert groove 19.

The pin member 20 is a round steel having a diameter of 3 mm, for example. The pin member 20 is provided on opposite ends thereof with a bearing 25 (see Fig. 1). On opposite sides with the conveyor 11 disposed therebetween, there are provided a pair of pin guide rails 26 which constitute a pin transfer system. By rollingly moving the bearings 25 along the pin guide rails 26, the pin members 20 can be moved in the moving direction X at the same speed as the conveyor 11 while maintaining the height of the center axis generally equal to the height of the center of the pin insert groove 19. The pin members 20 are arranged along the pin guide rails 26 at the same pitch (for example, 70 mm) as the pin insertion grooves 19. Accordingly, a plurality of the pin members 20 can be inserted in the respective pin insert grooves 19 in the moving direction X simultaneously.

The upstream side roll member 21 is a cylindrical member having a diameter of 125 mm, for example. The conveyor 11 is disposed between the upstream side roll member 21 and a downstream side roll member 27, as later described, and the conveyor 11 is turned endlessly at a predetermined speed by driving force of a driving motor. As shown in Fig. 2(b), when the conveyor 11 moving below is caused to make a change of direction upwardly, the upstream side roll member 21 enlarges the opening width k of the pin insert groove 19, i.e., the edges of the push-in groove are caused to move away from

each other depending on the curvature of the outer peripheral surface. In contrast, when the conveyor 11 is caused to move in the moving direction X from the outer peripheral surface, the opening width k of the pin insert groove 19 is reduced again so that the edges are caused to move towards each other (see Fig. 2(d)).

5 According to this embodiment, when the pin insert groove 19 located on the outer peripheral surface of the upstream side roll member 21 passes the outer peripheral surface so that the opening width k is brought from the enlarged state (see Fig. 2(b)) to the reduced state (see Fig. 2(d)), the pin member 20 is inserted in the pin insert groove 19 against resiliency of the expanded protective film plate 24 while sandwichingly retaining the back surface sheet 12 which is continuously fed out from a sheet feed roll 28 (see Fig. 1). By  
10 doing so, a part of the back surface sheet member 12 corresponding to the non-coated portion 15 is folded inwardly towards the back surface side of the back surface sheet member 12.

When the back surface sheet 12 is folded into the pin insert groove 19 through the  
15 pin member 20, the enlarged opening width k between a distal end of the protective film plate 24 and the adjacent sponge plate 23 is reduced again as the pin insert groove 19 located at the outer peripheral surface of the upstream side roll member 21 moves in the moving direction X (see Fig. 2(d)). As a consequence, the edge portions of the pair of upstream side and downstream side of push-in grooves 19 are moved towards each other,  
20 so that the folding edge portions 29 of the back surface sheets 12 are moved towards each other thereby forming a continuous surface-to-be-coated (surface-to-be-laid) for continuously coating the dough-like detergent 13 thereon from the coating head 16. As shown in Figs. 1 and 2(e), this surface-to-be-coated 30 is continuously coated with the dough-like detergent 13 coming from the coating head 16.

25 According to this embodiment, the pin members 20 are inserted in the pin insert grooves 19 in the state that the height of the center axis of each pin member 20 is brought to be equal to the center height of each pin insert groove 19. By properly adjusting the heightwise or crosswise position of the pin member 20 in the pin insert groove 19, the folding amount of the back surface sheet 12 sandwichingly held by the pin members 20  
30 can be increased/decreased. Therefore, by doing so, the width of the non-coated portion

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15, described later, can easily be adjusted. Such positional adjustment of the pin member 20 in the pin insert groove 19 can easily be made by properly controlling the relative position between the upstream side and downstream side roll members 21, 27 with the conveyor 11 disposed therebetween and pin guide rails 26 for guiding the bearing 25 mounted on the pin member 20. Also, the width of the non-coated portion 15 can easily be adjusted by varying the diameter of the pin member 20 to increase/decrease the folding amount of the back surface sheet 12.

According to this embodiment, a pin push-in roll 31 may be disposed above the upstream side roll member 21 in such a manner as to contact the conveyor passing an upper end portion of the upstream side roll member 21. The back surface sheet 12 can smoothly be folded inwardly by pressing the pin member 20 with the pin push-in roll 31 thereby causing the pin member 20 to be inserted in the pin insert groove 19.

On the other hand, according to this embodiment, the unfolding means 18 includes the downstream side roll member 27 for making a change of direction of the back surface sheet 12 from the moving direction X to the downward direction and tension applying means (not shown) for applying a pulling tension so as to pull the back surface sheet 12 in the moving direction X on a more downstream side than the downstream side roll member 27.

The downstream side roll member 27 is a cylindrical member, like the upstream side roll member 21, having a diameter of 125 mm, for example. When the conveyor 11 moving in the moving direction X is caused to make a change of direction downwardly, the downstream side roll member 27 enlarges the opening width k of the pin insert groove 19 as shown in Fig. 3 by the curvature of the outer peripheral surface. And the pin member 20, which is continuously moving along the moving direction X is taken out of the pin insert groove 19 so that the folded state of the back surface sheet 12 located at the non-coated portion 15 is released.

The tension applying means includes, among others, a feed roller (not shown) for feeding the back surface sheet 12 with the dough-like detergent 13 to the next sealing process, for example. Since the feeding speed is faster than the moving speed of the back

surface sheet 12 which is moved in the moving direction X by the conveyor 11, the back surface sheet 12 is pulled towards the downstream side in the moving direction X to thereby cause the fold-in edge portions 29, 29 of the back surface sheet 12 to be moved away from each other so that the non-coated portion 15 of the back surface sheet 12 is brought back so as to be flush with the surface-to-be-coated 30 (see Fig. 3).

According to this embodiment, on the upstream side of the downstream side roll member 27, there is a provision of a cutting roll 32 serving as cutting means which is located above the coated layer 14 formed by continuously coating the top surface of the back surface sheet 12. The cutting roll 32 is a cylindrical member of such a size dimension that the 1/4 length of its circumference is equal to the pitch length of the pin insert groove 19. The cutting roll 32 has cutters 33 projecting from the positions obtained by dividing the circumference into four. Each cutter 33 is located immediately above the pin insert groove 19 with the non-coated portion 15 of the back surface sheet 12 folded therein. The cutter 33 is cut into the coated layer 14 formed by continuously coating the dough-like detergent 13 onto the coated surface 30 at the location immediately above the pin insert groove 19, so that a cut line is formed therein. The cutting roll 32 is controlled such that the speed of rotation at its peripheral surface is equal to the moving speed of the conveyor 11 in the moving direction X and the four cutters 33 are sequentially cut into the coated layer 14 immediately above the pin insert grooves 19 which are arranged at a predetermined pitch, thereby forming the cut lines therein.

By preliminarily forming the cut lines in the continuous coated layer 14 on the upstream side of the downstream side roll member 27, even the dough-like detergent 13 having viscosity can easily be cut away towards opposite sides through the cut lines when the fold-in edge portions 29 of the back surface sheets 12 are moved away from each other while taking out the pin members 20 from the pin insert grooves 19. Therefore, it can easily be avoided that the dough-like detergent 13 is exposed to the non-coated portion and that the dough-like detergent 13 is adhered to the pin member 20 to soil it when the pin member 20 is taken out.

Cutter soil removing means (not shown) for cleaning the cutter 33 using a brush, a woven fabric, a nonwoven fabric, air or the like after the dough-like detergent 13 is cut, is

disposed adjacent the cutting roll 32. Also, pin soil removing means (not shown) for cleaning the pin member 20 taken out of the pin insert groove 19 using a brush, a nonwoven fabric, air or the like, is disposed adjacent the pin guide rails 26 on the more downstream side than the fold-in releasing means 18.

5 As another means for preliminarily forming a cut line in the continuous coated layer 14 at the location immediately above the pin insert groove 19 with the non-coated portion 15 folded therein, there are the following methods. Firstly, there is a reciprocating type cutting method in which the cut line is formed by moving the cutter up and down. There is also an equal speed reciprocating type cutting method in which the cut-in state of  
10 the cutter with respect to the coated layer 14 is maintained for a predetermined time together with the moving speed of the coated layer 14 after the cutter is cut into the coated layer 14, so that a cut line can positively be formed. There is also a traverse type cutting method in which a cut line can be formed in the coated layer 14 by moving a cutter in the widthwise direction of the coated layer 14.

15 According to this embodiment, by using the intermittently laying apparatus 10 having the above-mentioned construction, the coated layer 14 formed of the dough-like detergent 13 can easily be formed on the surface of the belt-like back surface sheet 12 continuously fed in the moving direction X and moved by the conveyor 11, while intermittently interposing the non-coated portions 15 in the moving direction X. That is to  
20 say, first on the upstream side of the coating head 16, the back surface sheet 12 located at the non-coated portion 15 is folded inwardly towards the back surface side of the back surface sheet 12 while inserting the pin member 20 in the pin insert groove 19, and the continuous surface-to-be-coated 30 is formed on the top surface side of the back surface sheet 12. Then, after the dough-like detergent 13 is continuously fed to the surface-to-be-  
25 coated 30 from the coating head 16 to form the coated layer 14 thereon, the inwardly folded non-coated portion 15 of the back surface sheet 12 is brought back so as to be flush with the coated surface 30 on the downstream side of the coating head 16, so that the non-coated portions 15 are intermittently interposed between the adjacent coated layers 14 formed of the continuously laid dough-like detergent 13.

30 One pair of the coating heads 16 are disposed in adjacent relation in a direction

orthogonal to the moving direction X and the dough-like detergent 13 are coated on the back surface sheet 12 in two rows. By arranging the pair of coating heads 16 at a predetermined interval, a longitudinal non-coated portion 15 can easily formed between the two rows of coated layers 14 along the moving direction X. By this, the coated layers are arranged in two rows on the back surface sheet 12, while longitudinally and laterally interposing the non-coated portions 15.

According to this embodiment, since the non-coated portions are intermittently interposed by repeating the folding and unfolding of the back surface sheet 12 along the flow of the back surface sheet 12 without a need of intermittently controlling the coating head 16 by repeating the supply and stop of the dough-like detergent made by the coating head 16 at every predetermined time interval and while maintaining the continuous supply of the dough-like detergent 13 made by the coating head 16, the coated layer 14 formed of the dough-like detergent 13 can easily be formed while intermittently interposing the non-coated portions in the moving direction X with a high degree of precision. Thus, production capability of the sheet-like detergent package can be enhanced.

It should be noted that the present invention should not be limited to the above embodiment and many changes and modifications can be made. For example, the present invention should not be limited to the dough-like detergent. Instead, the present invention can likewise be employed when other compositions such as semi-fluidized compositions, or compositions in the form of powder or particle are to be laid. Also, it is not absolutely necessary that the top surface side sheet-like member is disposed in such a manner as to cover the laid layer and the non-coated portions are sealed in the next process. In other words, those procedures in the next process may be employed only in accordance with necessity. A provision of the cutting means is not absolutely necessary, either. In addition, the folding means and unfolding means should not be limited to those of the above embodiment.

#### Industrial Applicability

According to an intermittently laying method and an intermittently laying apparatus of the present invention, a laid layer formed of a fluidized substance can easily be formed on the surface of the sheet-like member while intermittently interposing non-laid portions

in the moving direction with high degree of precision and thus production capability can be enhanced.

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## CLAIMS

1. An intermittently laying method for intermittently forming laid layers comprising a fluidized substance laid thereon on a surface of a sheet-like member moving in one direction, in the moving direction, said method comprising steps of:

5 folding a part of said sheet-like member corresponding to a non-laid portion between adjacent laid portions inwardly towards a back surface side of said sheet-like member on an upstream side of laying means for laying said fluidized substance on said sheet-like member thereby forming a continuous surface-to-be-laid on a surface side;

10 continuously supplying said fluidized substance from said laying means to said surface-to-be-laid thereby forming said laid layer;

bringing back said inwardly folded non-laid portion of said sheet-like member so as to be flush with said surface-to-be-laid on a downstream side of said laying means; and

intermittently interposing said non-laid portion between continuously laid said adjacent laid layers formed of said fluidized substance.

2. An intermittently laying apparatus for intermittently forming laid layers comprising a fluidized substance laid thereon on a surface of a sheet-like member moving in one direction, in the moving direction, said apparatus comprising:

15 laying means for laying said fluidized substance on said sheet-like member; folding means disposed on an upstream side of said laying means and adapted to fold a part of said sheet-like member corresponding to a non-laid portion between adjacent laid portions inwardly towards a back surface side of said sheet-like member thereby forming a continuous surface-to-be-laid on a surface side; and unfolding means disposed on a downstream side of said laying means and adapted to bring back said inwardly folded non-laid portion of said sheet-like member, so as to be flush with said surface-to-be-laid.

3. An intermittently laying apparatus according to claim 2, further comprising cutting means disposed on an upstream side of said unfolding means and adapted to form a cut line in said laid layer formed of said fluidized substance, which is continuously laid, at a portion immediately above said inwardly folded non-laid portion of said sheet-like member.

4. An intermittently laying apparatus according to claim 2, wherein said folding means includes a plurality of push-in grooves extending in a direction perpendicular to the moving direction, a plurality of insert members which are moved in the moving direction at the same speed as said push-in grooves and are inserted along said push-in grooves when moving in the moving direction, and an upstream side roll member for guiding said push-in grooves in the moving direction, and wherein when said push-in grooves are brought from a state in which said push-in grooves are located at an outer peripheral surface of said upstream side roll member and an opening width of each of said push-in grooves is enlarged to a state in which said push-in grooves pass the outer peripheral surface and an opening width of each of said push-in grooves is reduced, said insert members are inserted in said push-in grooves while sandwichingly holding said sheet-like member which is continuously supplied, so that a part of said sheet-like member corresponding to said non-laid portion is folded inwardly towards a back surface side of said sheet-like member.

5. An intermittently laying apparatus according to claim 4, further comprising a function for adjusting a width of said non-laid portion by increasing/decreasing a folding amount of said sheet-like member sandwiched by said insert members, said folding amount being increased/decreased by adjusting the position of said insert members in said push-in grooves when said insert members are inserted in said push-in grooves.

Fig. 1

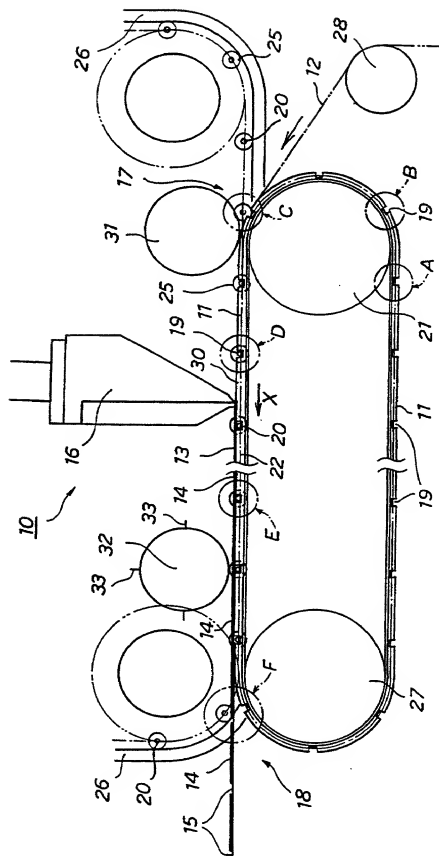


Fig. 2(a)

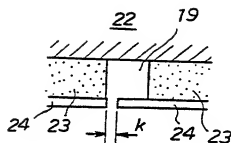


Fig. 2(b)

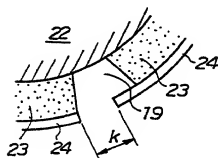


Fig. 2(c)

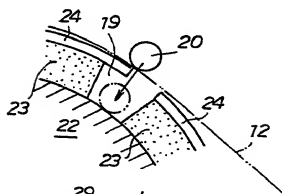


Fig. 2(d)

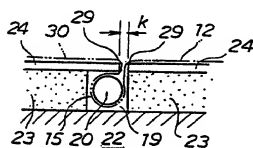
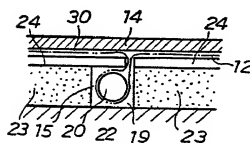
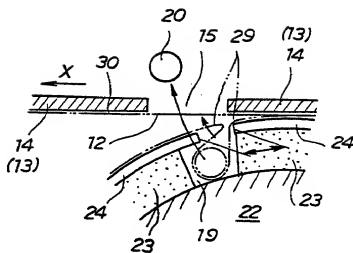


Fig. 2(e)



**Fig. 3**



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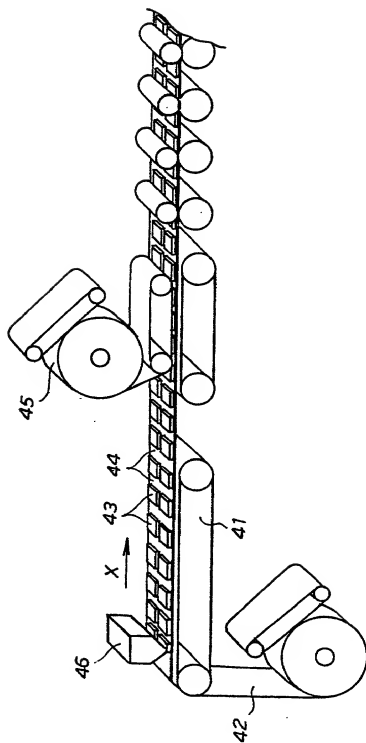


Fig. 4

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## FOR PATENT AND DESIGN APPLICATIONS

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated next to my name; that I verily believe that I am the original, first and sole inventor (if only one inventor is named below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

"METHOD FOR INTERMITTENTLY FORMING LAID LAYERS"

Insert Title:

Fill in Appropriate  
Information -  
For Use Without  
Specification  
Attached:

the specification of which is attached hereto. If not attached hereto,

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United States Application Number \_\_\_\_\_; and/or

the specification was filed on June 7, 2000 as PCT

International Application Number PCT/JP00/03692; and was

amended under PCT Article 19 on \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months (six months for designs) prior to this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows.

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Insert Priority  
Information:  
(if appropriate)

➔ Prior Foreign Application(s)

11-163976

(Number)

Japan

(Country)

June/10/1999

(Month/Day/Year Filed)

Priority Claimed

☒ Yes ☐ No

☐ Yes ☐ No

☐ Yes ☐ No

☐ Yes ☐ No

☐ Yes ☐ No

☐ Yes ☐ No

☐ Yes ☐ No

☐ Yes ☐ No

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I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

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(Application Number)

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All Foreign Applications, if any, for any Patent or Inventor's Certificate Filed More Than 12 Months (6 Months for Designs) Prior To The Filing Date of This Application:

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I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

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(if any)

(Application Number)

(Filing Date)

(Status - patented, pending, abandoned)

(Application Number)

(Filing Date)

(Status - patented, pending, abandoned)

I hereby appoint the following attorneys to prosecute this application and/or an international application based on this application and to transact all business in the Patent and Trademark Office connected therewith and in connection with the resulting patent based on instructions received from the entity who first sent the application papers to the attorneys identified below, unless the inventor(s) or assignee provides said attorneys with a written notice to the contrary:

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Insert Date This  
Document is Signed  
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Insert Citizenship

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